



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/062,443	02/05/2002	Chandrakant D. Patel	100110202-1	2568

7590 01/07/2005
HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

KOMOL, VAJIRACHAI

ART UNIT	PAPER NUMBER
----------	--------------

2115

DATE MAILED: 01/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/062,443

Applicant(s)

PATEL ET AL.

Examiner

Vajirachai Komol

Art Unit

2115

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless – (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 3, 10, 20 and 21 are rejected under 35 U.S.C. 102[e] as being anticipated by Memory et al [U.S. Pat. 6,828,675].

Regarding to claim 1, Memory et al teach a system for cooling at least one computer component [fig. 1], said system comprising:

- a plurality of cold plates [22, fig. 1] adapted to transfer heat from a plurality of computer components [14, fig. 1] to a cooling fluid [16, fig. 1];
- a supply line to supply said cooling fluid to, and from [16, 18, fig. 1], said cold plates; and
- a housing [12, fig. 1] configured to support said plurality of computer components [14s, fig. 1] and configured to support said plurality of cold plates [22s, fig. 1] in thermal communication with said plurality of computer components.

Regarding to claim 20, Memory et al teach a method for cooling at least one electronic component [14, fig. 1] in a system for cooling comprising at least one cold plate [22, fig. 1] adapted to transfer heat from at least one computer component to a fluid, and a supply line to supply a fluid to [16, fig. 1], and from [18, fig. 1], heat exchanger [24, fig. 1], said method comprising the steps of:

- providing a housing [12, fig. 1] to receive removable electronic components [14, fig. 7];
- providing at least one cold plate [22, fig. 1] within the housing to absorb heat from at least one computer component [par. 28, lines 1 – 7], wherein said cold plate is configured to allow fluid to pass through the cold plate [30, 36, 32, fig. 1];
- circulating a fluid within the housing [16, 18, fig. 1] and through the cold plate [30, 36, 32, fig. 1] and then away from the cold plate such that heat is absorbed from the cold plate into the fluid [par. 28, lines 1 – 7].

Regarding to claim 2, Memory et al further teach:

- a heat exchanger [24, fig. 1] adapted to transfer heat from a cooling fluid to a medium [par. 28, lines 7 – 17].

Regarding to claim 3, Memory et al further teach:

- a heat exchanger [24, fig. 1] adapted to transfer heat from the cooling fluid to another fluid [par. 28, lines 7 – 17].

Regarding to claim 10, Memory et al further teach:

- a self-contained unit [12, fig. 1] in the form of a single chassis.

Regarding to claim 21, Memory et al further teach the steps of:

- circulating the fluid through a heat exchanger [24, fig. 1] such that the heat exchanger operates to absorb heat from the fluid and transfer the heat into a medium [par. 28, lines 7 – 17].

Claim Rejections - 35 USC § 103

3. Claims 6, 8, 12, 13, 14, 16, 17 and 22 are rejected under 35 U.S.C. 103[a] as being unpatentable over Memory et al [U.S. Pat. 6,828,675].

Regarding to claim 12, Memory et al teach a system for cooling at least one electronic component [fig. 1], said system comprising: means for holding a plurality of electronic components [14s, fig. 1];

- communication connection means for providing communication between the computer boards [fig. 7];

- a plurality of cold plates [22s, fig. 1], each cold plate being adapted to serve as a heat exchanger for one or more components on one or more of electronic components [par. 28, lines 1 - 7];
- means for holding one or more of the cold plates in thermal communication with one or more of said electronic components [22, 20, 14, fig. 1];
- means for passing a fluid [30, 32, fig. 1] through each of the one or more cold plates so the one or more cold plates transfer heat energy from the one or more computer boards to the fluid [par. 28, lines 1 - 7]; and
- means for transferring heat away from the fluid [par. 28, lines 7 - 17].

However, Memory et al do not explicitly teach:

- electronic connection means for providing electrical power to the electronic components;
- connecting the cooling system to an apparatus external to the system

As such, a routineer in the art would recognize that an electronic connection[s] is inherent to Memory et al teachings since an electronic connection[s] is well known in the art as a mode to provide current to electronic components. Also, a routineer in the art would recognize that the cooling system connects to an apparatus external to the system through connections [16, 18, fig. 7]

Regarding to claims 6, 8 and 22, Memory et al further teach a supply line ["liquid in"] for connecting cooling liquid to a heat exchanger [16, 52 and 24, fig. 1]. However,

Memory et al do not explicitly teach a controllable valve to modulate the cooling liquid in the system.

It would have been obvious to one of ordinary skill in the art to modify the teachings of Memory et al to incorporate a controllable valve[s] on the supply line [“liquid in”] since a controllable valve is well known in the art as a mode to modulate the flow of fluid.

Regarding to claim 13, Memory et al further teach means for passing a fluid through each of the one or more cold plates [30, 36, 32, fig. 1] comprises:

- a supply line to supply said fluid between said one or more cold plates and said means for transferring heat away from the fluid [par. 28, lines 1 – 17];
and
- one or more pumps [58, fig. 1] to circulate the fluid through at least one of:
 - said one or more cold plates [22s, fig. 1];
 - said means for transferring heat away from the fluid [24, fig. 1];
and
 - said supply lines [16, 18, 30, 32, fig. 1].

Regarding to claim 14, Memory et al further teach means for transferring heat away from the fluid comprises [24, fig. 1]:

- a second heat exchanger adapted to draw heat from the fluid and transfer it to a medium [par. 28, lines 1 - 17].

Regarding to claim 16, Memory et al further teach means for holding a plurality of electronic components [14s, fig. 7], comprises a housing [fig. 7], said housing being adapted to removable receive a plurality of electronic components [fig. 7].

Regarding to claim 17, Memory et al further teach means for holding one or more of the cold plates in thermal communication with one or more of said electronic components [20, 15, 14, fig. 1].

4. Claims 4, 5, 7, 9, 11, 15, 18, 19, 23, 24, 25 and 27 are rejected under 35 U.S.C. 103[a] as being unpatentable over Memory et al [U.S. Pat. 6,828,675] in further view of Macias et al [U.S. Pat. 6,408,630].

Regarding to claim 4 and 27, Memory et al teach all the limitations of claim 1. However, Memory et al do not teach an electronic controller. Macias et al teach a computer enclosure cooling unit including an electronic controller [7, fig. 1]. As such, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Memory et al and Macias et al because they both directed to the teaching of cooling electronic components and Macias et al teach the details of the electronic controller unit which is missing in Memory et al system.

Regarding to claims 5 and 15, Memory et al and Macias et al teach all the limitations of claims 4 and 12. Macias et al further teach the electronic controller is configured to modulate the cooling of at least one of said computer components [col. 3, line 67 – col. 4, line 4].

Regarding to claim 7, Memory et al and Macias et al teach all the limitations of claims 1 and 4, Macias et al further teach supplying cooling fluid in response to instructions from an electronic controller [col. 3, line 67 – col. 4, line 4]. However, Macias et al do not explicitly teach a controllable valve is adapted to modulate the cooling liquid in the system.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the teachings of Macias et al to incorporate a controllable valve[s] on the supply line [“liquid in”] since a controllable valve is well known in the art as a mode to modulate the flow of fluid.

Regarding to claim 9, Memory et al teach one or more pumps operable to circulate the fluid [58, fig. 1]. However, Memory et al do not explicitly teach a fluid reservoir attached to supply line.

It would have been obvious to one of ordinary skill in the art to modify the teachings of Memory et al to incorporate a fluid reservoir attached to supply line since a fluid reservoir is well known in the art as a mode to store fluid.

Regarding to claims 11, 18, 19 and 24, Memory et al and Macias et al teach all the limitations of claims 12 and 20. Macias et al further teach a computer enclosure cooling unit including an electronic controller [7, fig. 1]. However, Macias et al do not teach a sensor to measure/monitor the power consumption of a computer component.

It would have been obvious to one of ordinary skill in the art to modify the teachings of Macias et al to allow the electronic controller to measure the power consumption of computer component[s] in addition to temperature since measuring/monitoring the power consumption is well known in the art.

Regarding to claim 23, Macias et al teach a controller unit [7], which control the temperature within the system. However, Macias et al do not explicitly teach the step of monitoring the temperature within the system. As such, a routineer in the art would recognize that in order to control the temperature within the system the controller unit [7] must be able to monitor the temperature within the system.

Regarding to claim 25, Macias et al further teach the step of:

- modulating the circulation of the fluid through the system, in response to a monitoring [col. 3, line 67 – col. 4, line 4].

Regarding to claim 26, Macias et al further teach the step of:

- modulating the operation of the heat exchanger, in response to a monitoring step [col. 3, line 67 – col. 4, line 4].

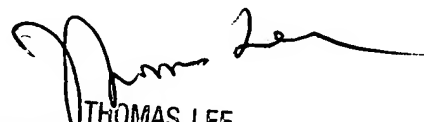
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vajirachai Komol [Ben] whose telephone number is (571) 272-5858. The examiner can normally be reached on 8:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Lee can be reached on (571) 272-3667.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VK


THOMAS LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100